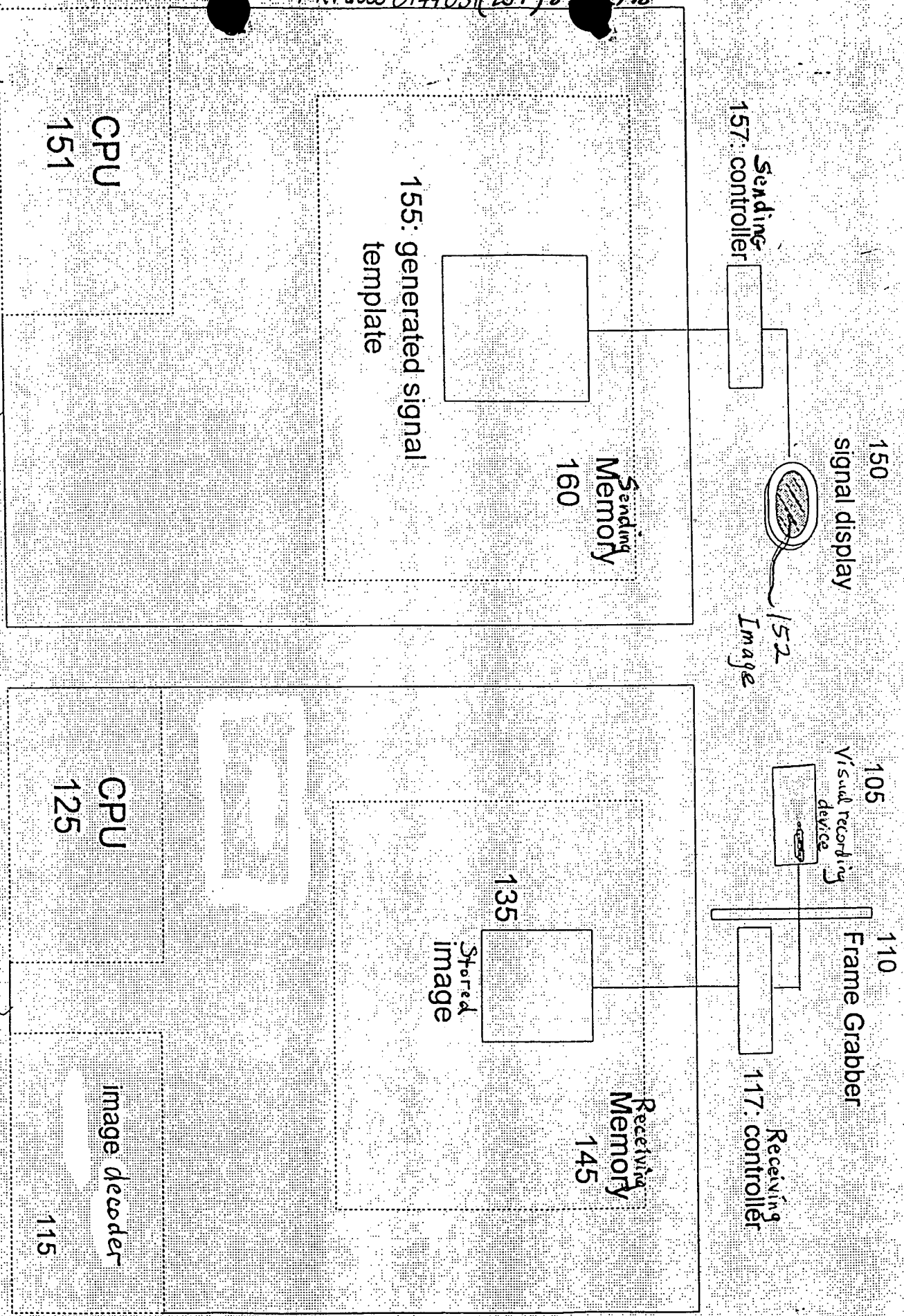


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170: signal transmitting device T

Figure 1

175: signal receiving device R

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YOR9-2000-0149 US1 (8928-378)

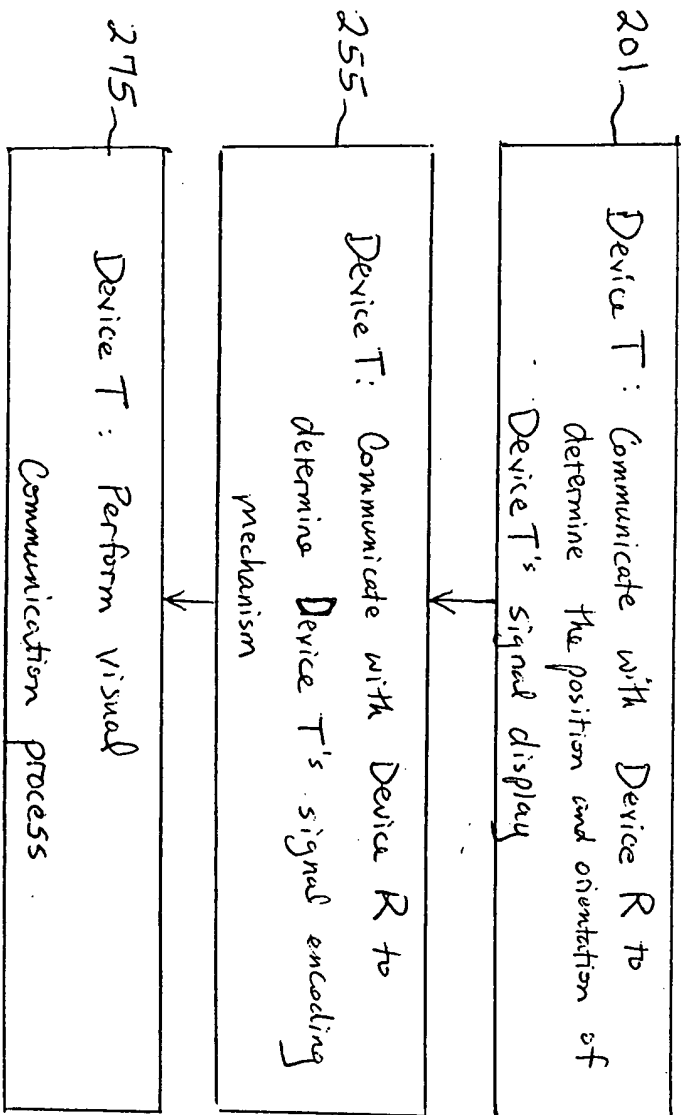
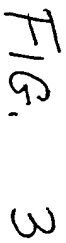


FIG. 2

09640284, 081500



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YOR9-2000-0149US1 (8728-37)

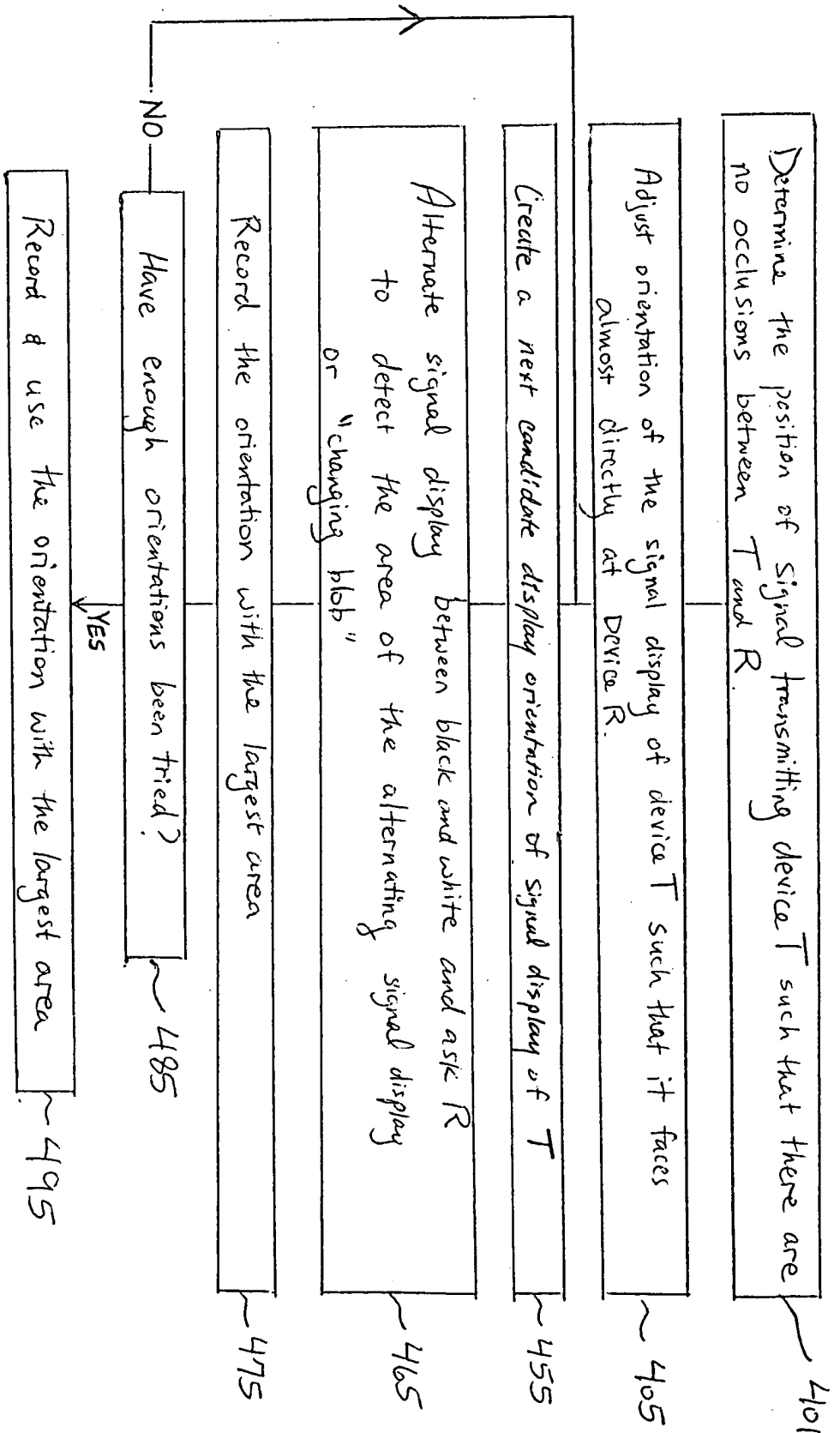


FIG. 4

09640234, 081600

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YOR9-2000-0149US1 (8728)

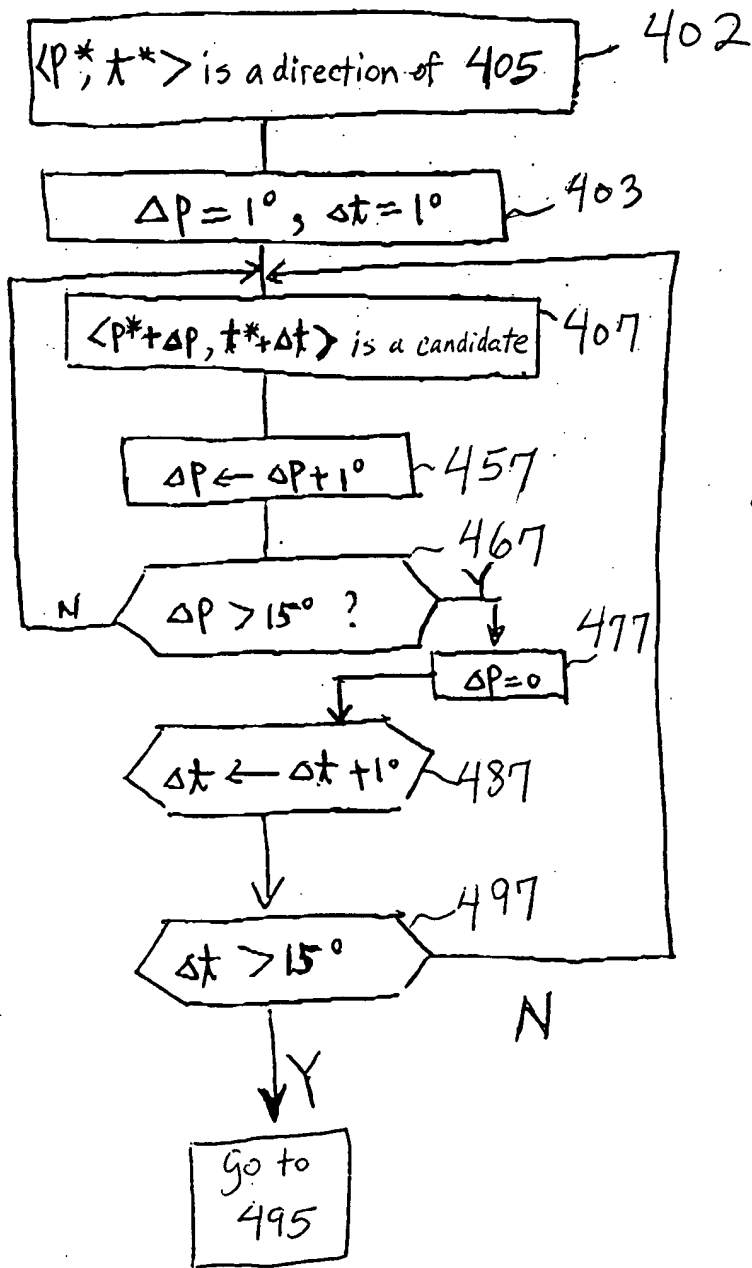


FIG. 4A

00940234 081600

Determine the position of R such that there is no object occluding R & T

501

Adjust the camera direction of device R such that it points directly to device T and adjust the zoom of R such that it gets a complete view of T

515

Re-adjust the direction of the camera of R such that the center of the display screen of T appears at the center of the image taken by the camera of R

555

Adjust the zoom of the camera of R such that it gets an adequately sized view of the display screen of T

575

FIG. 5

09640234.08.1500

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YOR9-2000-0149051 (8728-3)

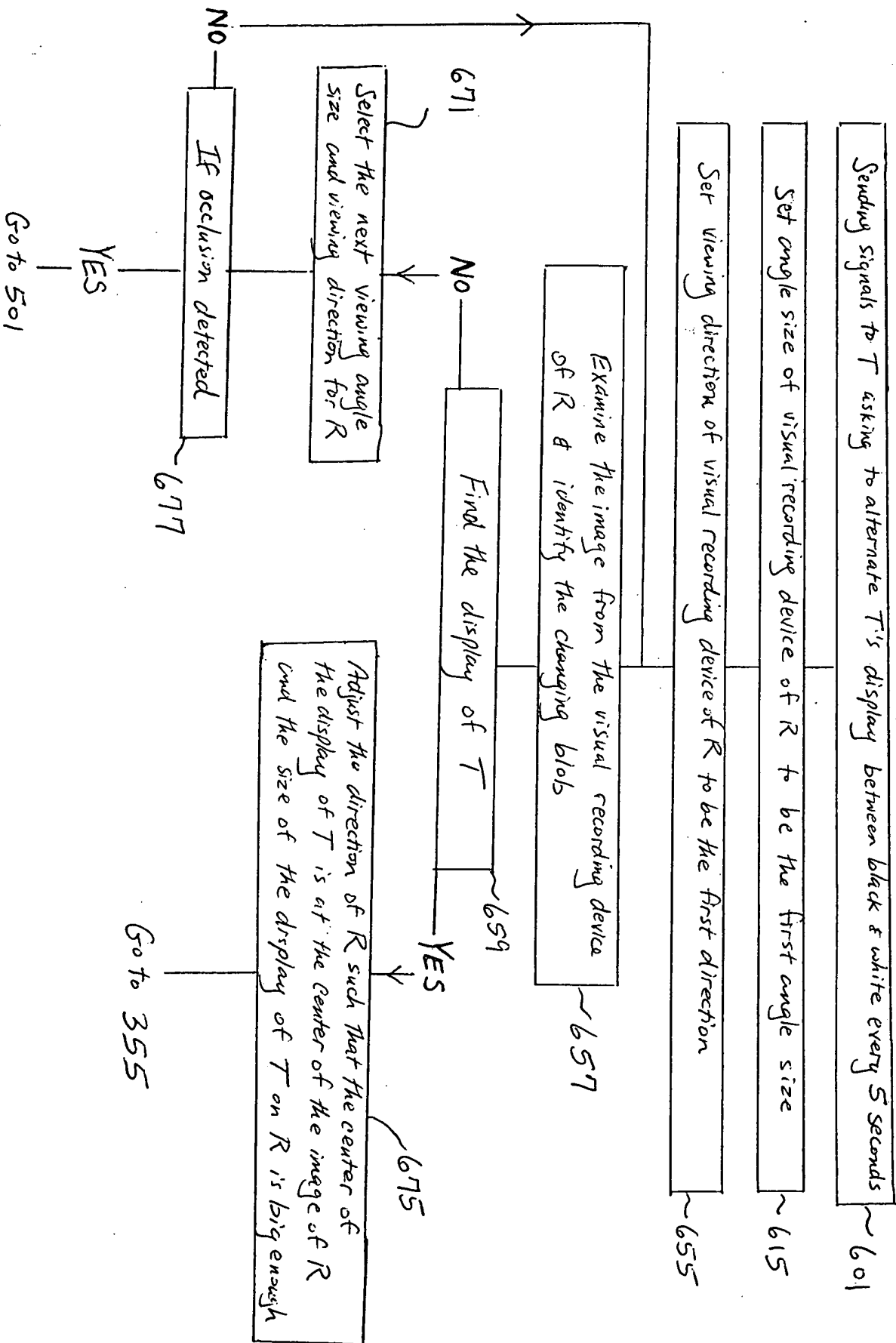


FIG. 6

09640284.081600

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YOR9-2000-0149US1(8728)

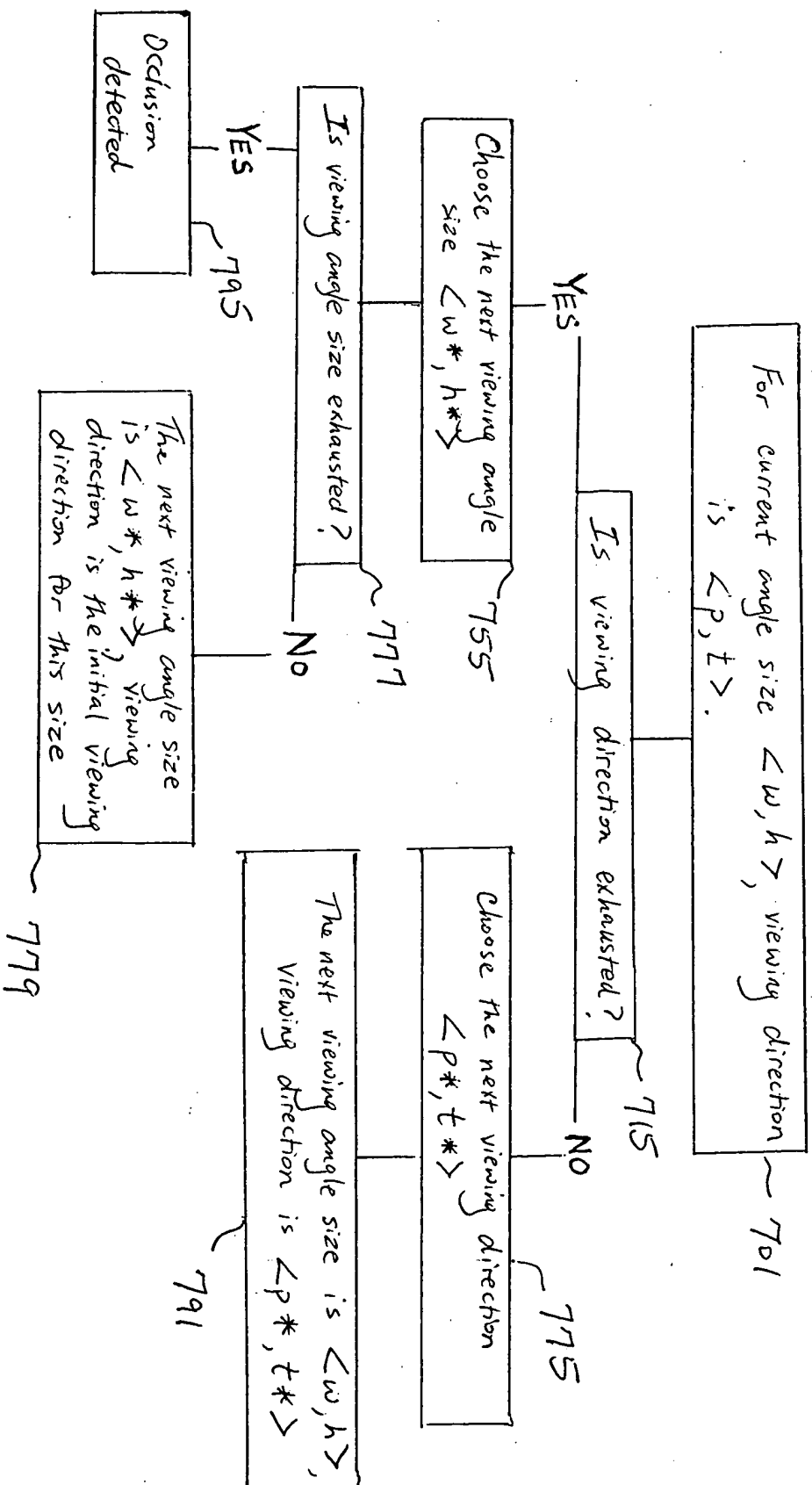


FIG. 7

09640284, 081600

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YOR9-2000-0149US1 (8728)

Recording device of R determines an adequate size of a changing blob caused by the display of T (off-line)

801

For the biggest angle size of the visual recording device of R, determine the acceptance distance range N_0 and F_0 between R and T. Within this range, the display screen of T can be identified. (this range can be calculated or experimentally obtained offline)

815

An i^{th} angle size of the visual recording device can be automatically obtained by using a formula that considers initial angle size and N_0 and F_0 . The goal of the angle size selection is to choose those angle sizes that can cover the whole distance of the environment without overlap

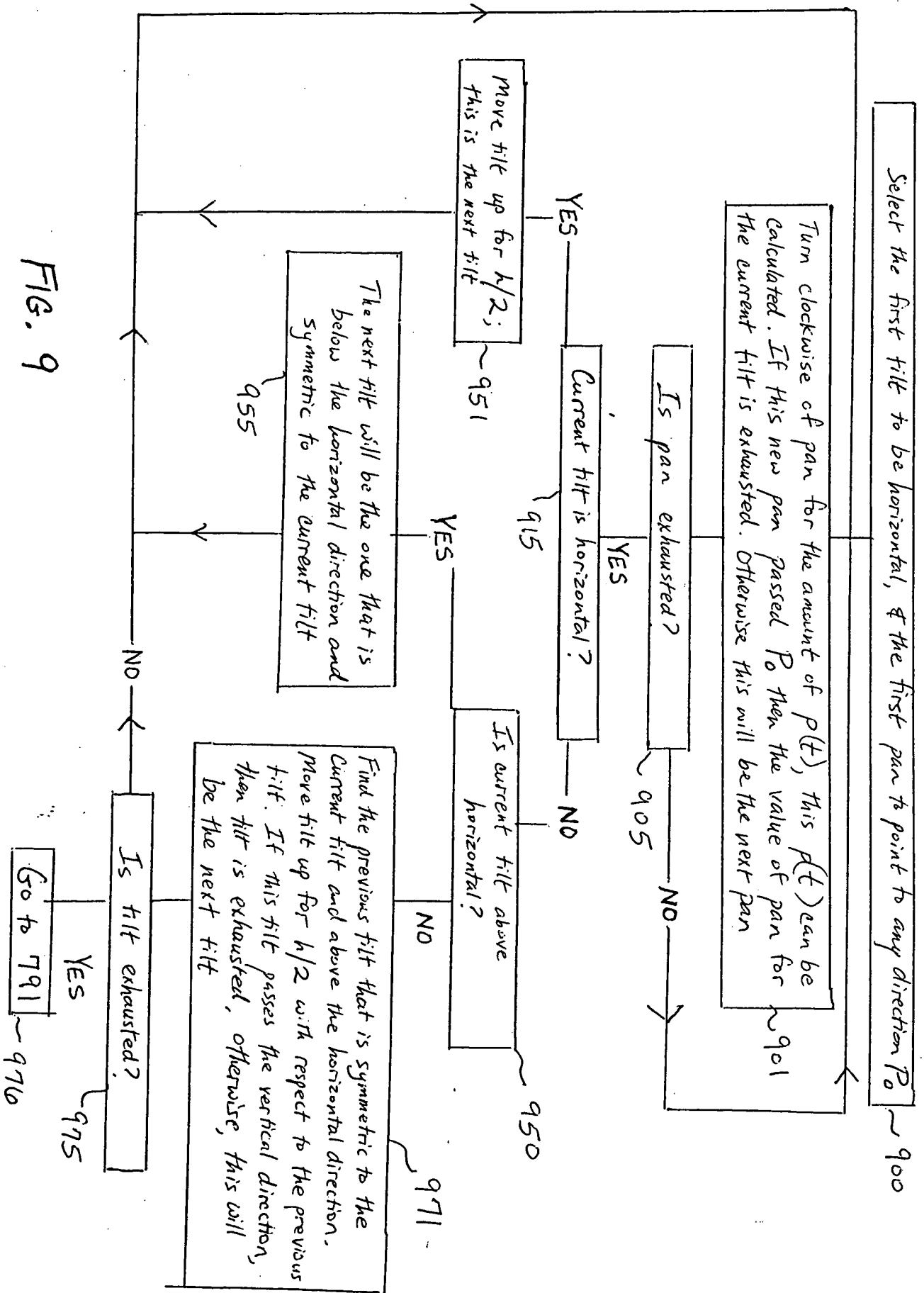
855

A next angle size is selected from those candidate angle sizes obtained in Block 855

875

FIG. 8

09640234.081600



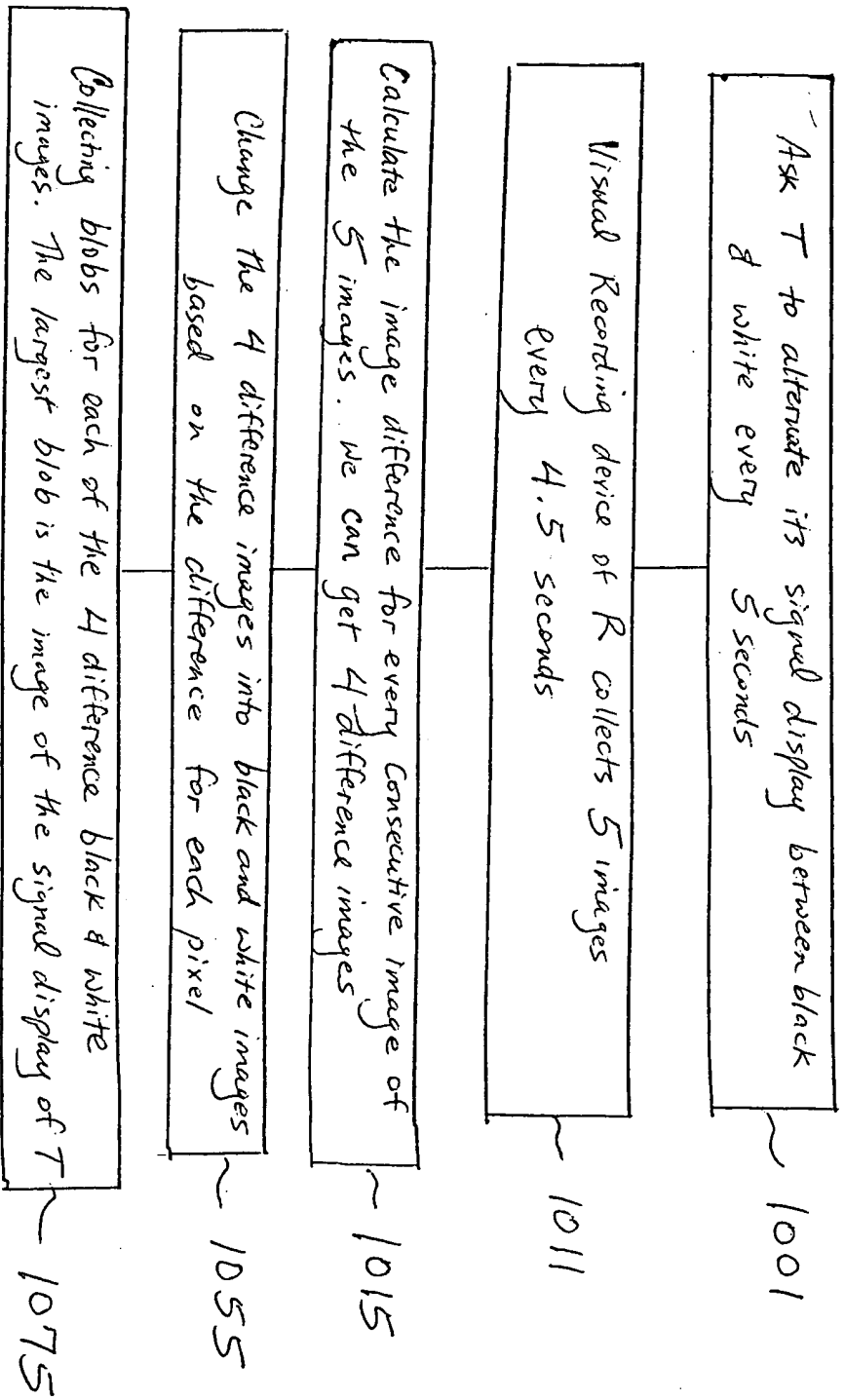


FIG. 10

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YOR9-2000-0149051 (8728-3)

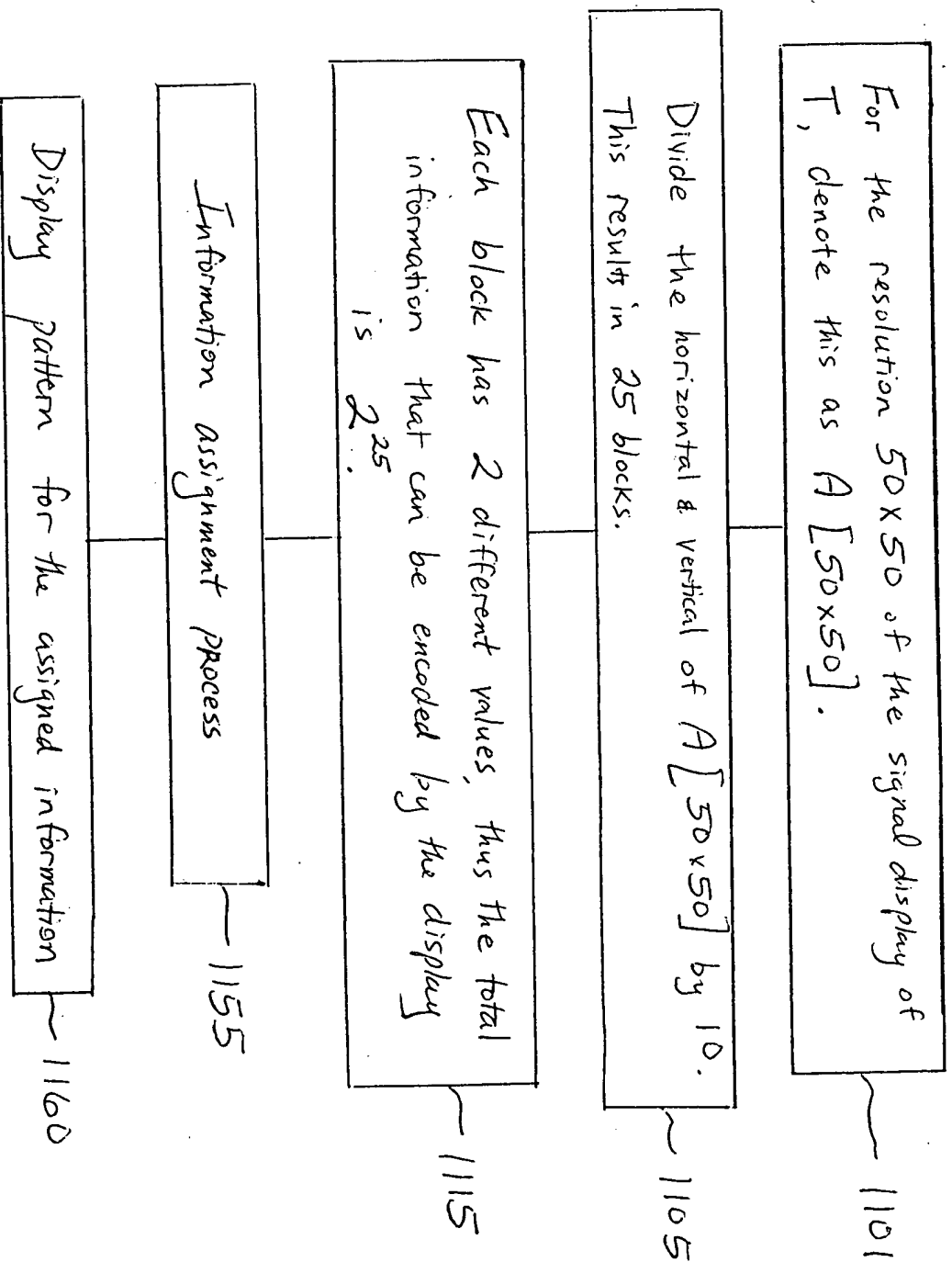


FIG. 11

09640234, 081600

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YOR9-2000-0149 US1 (8728-3)

1201

FIG. 12

09640234.081600

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YOR9-2000-0149051 (8728-5)

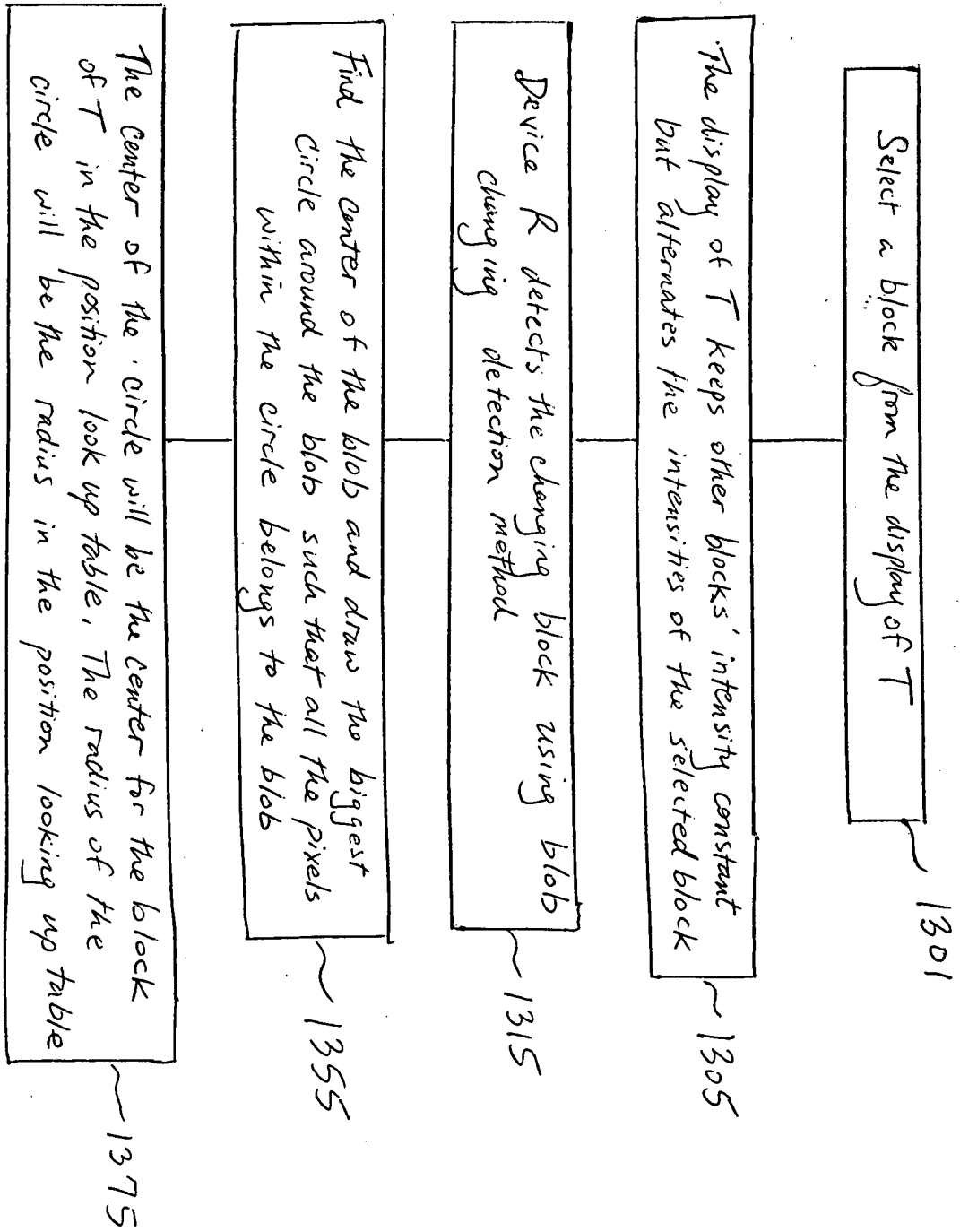


FIG. 13

09640234, 031600

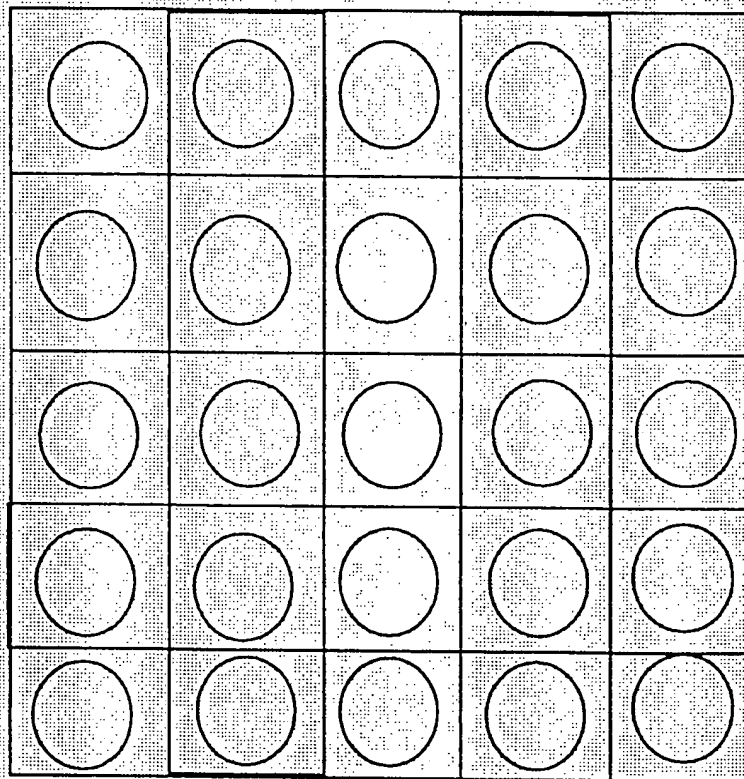


FIG. 14

09640234.08.1500

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YOR9-2000-0149US1 (8728)

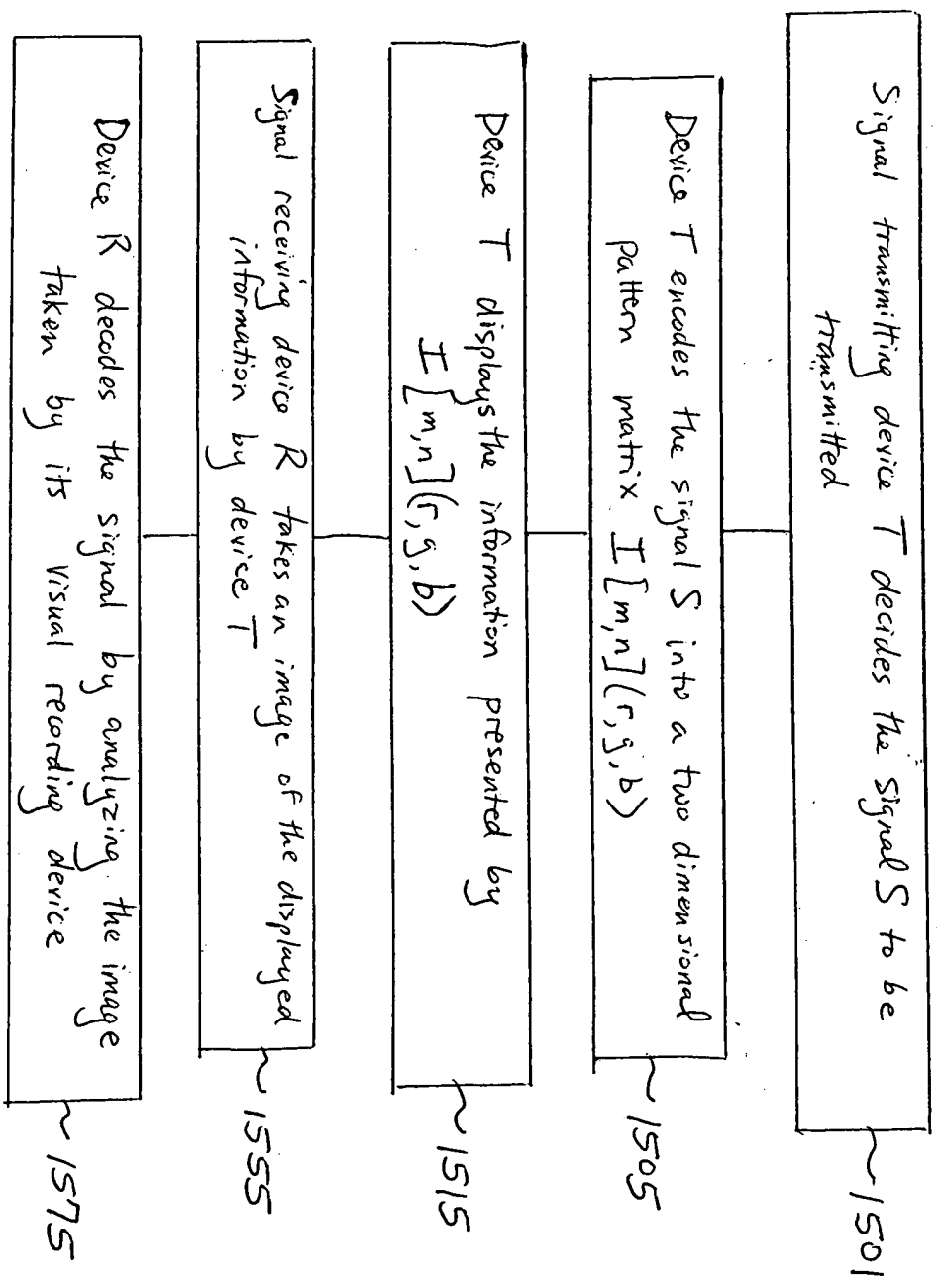


FIG. 15

09640284.081500

Visual recording device of R takes an image $B[w, h]$ that contains the displayed GUI from device T. Suppose the width & height of image $B[w, h]$ is 150×150

1601

Figure out the positions of the centers of the images of all the blocks of the displayed GUI by device T with the position & radius look up table

1605

Draw circles centered at the centers found in Block 1605. The radius of these circles should be read from the position & radius look up table

1615

For each circle calculate the average image intensities among each pixel within the circle. These average intensities are taken as the average intensities of the corresponding blocks.

1655

Change the average intensities of all the blocks into black & white intensities (b-w-i-). If a b-w-i- is less than 50, the original block is encoded black, otherwise it is encoded white.

1675

The signal S transmitted from T is decoded by decoding the black & white pattern formed in Block 1675.

1695

FIG. 16

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09640234.031600

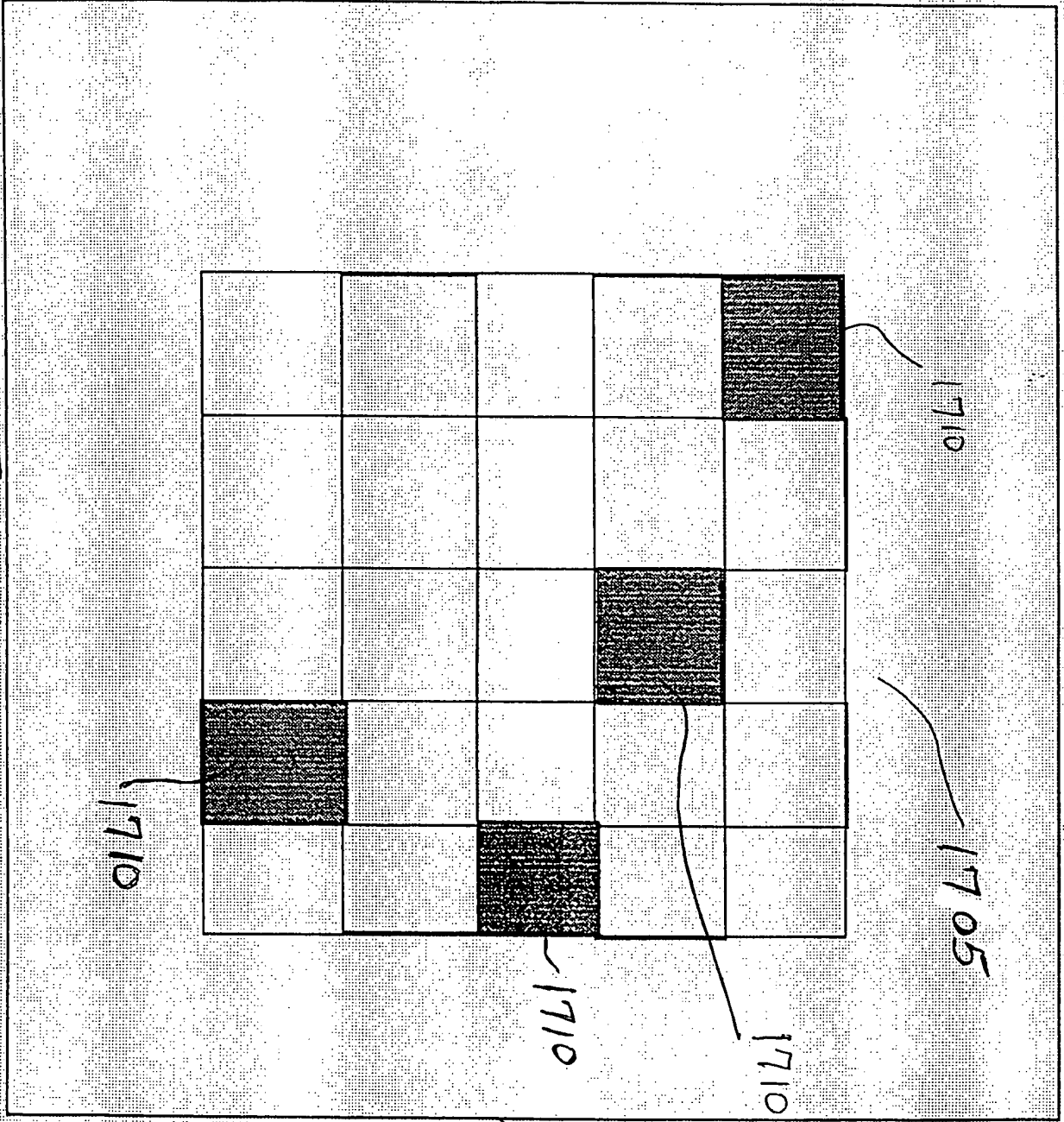


FIG. 17
10540234.031500

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YOR9-2000-0149US1(8728)

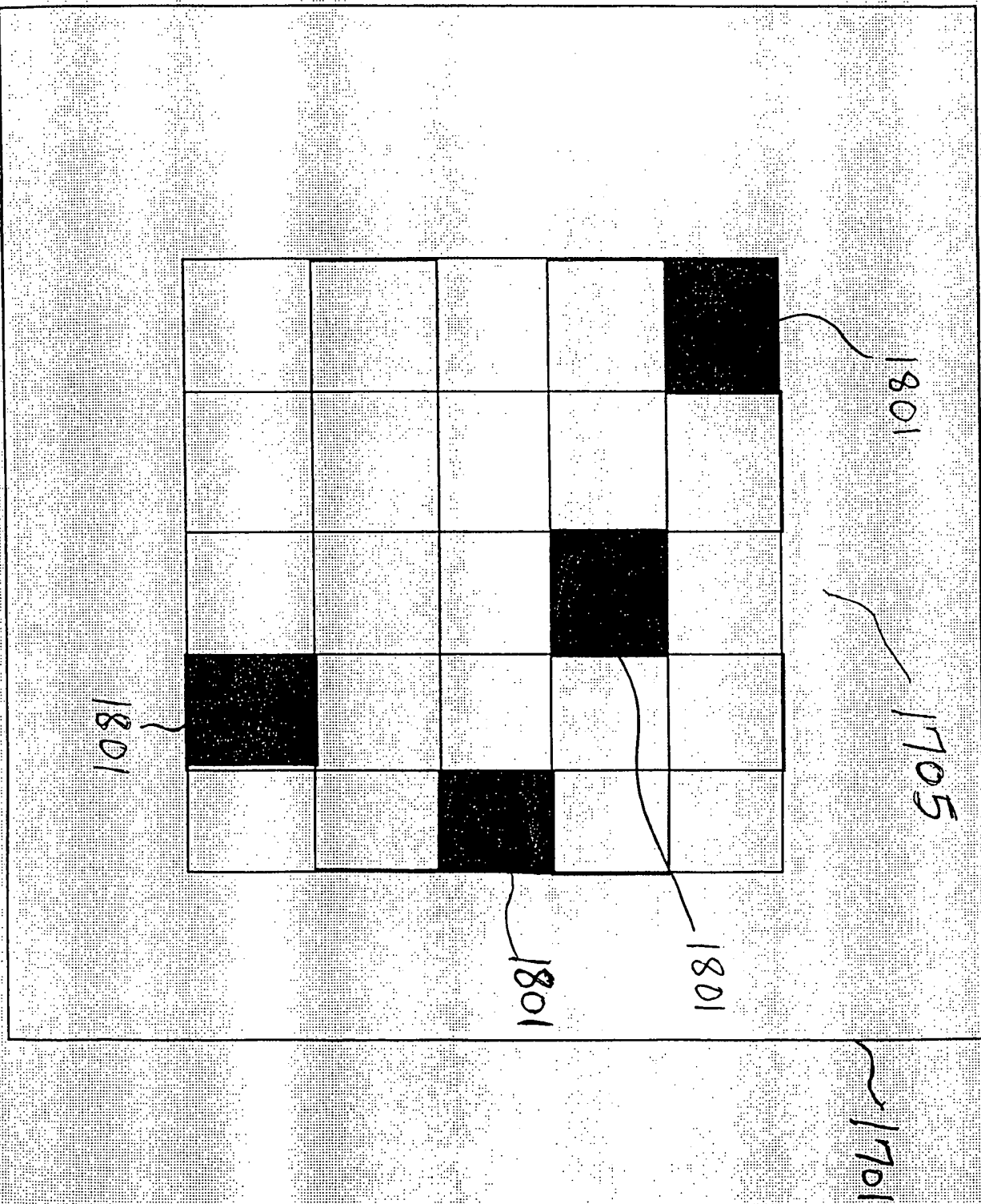


Figure 18